Summary

Neway CNC now has implementation experience in hundreds of automatic production line, can meet the requirement of high efficiency, high quality and low cost of automatic processing.

With competition increasing and labor cost rising, the requirements for better equipment efficiency, manufacturing cost and product quality etc. Many forward-looking companies have already applied automatic processing line to replace manual operation, achieved remarkable results.

For the continued growth of automation needs, in response to the call of the industrial 4.0, Neway CNC specially dispatched technical elite, set up the automation application engineering department, responsible for the whole process of tracking service from the process plan to the equipment delivery, and provide a complete set of automation solutions for the customers.

Typical Cases

Case 1/01-02 Automatic processing line of engine cylinder block
Case 2/03-04 Automatic processing line of half axle gear
Case 3/06-08 Automatic processing line of claw pole
Case 4/07-08 Automatic processing line of forged steel valve
Case 5/09-10 Automatic processing line of shutoff valve
Case 6/11-12 Automatic processing line of automobile wheel hub
Case 7/13-14 Automatic processing line of heat exchanger
Case 8/15-16 Automatic processing line of elevator shaft
Case 9/17-18 Automatic processing line of piston
Case 10/19-20 Automatic processing line of Retarder stator
Case 11/21-22 Automatic processing line of bearing inner race
**CASE 1**

Automatic processing line of engine cylinder block

Workpiece: cylinder block

Material: HT250

This is a turkey project, all the processing technology schemes, horizontal machining center HM634HP, fixtures, tools and truss manipulators are provided by Neway. Processing techniques are finish milling head face, finish boring 4 holes (up block hole, down block hole and stop hole) with non-standard boring bar in 1 time. Pre inspection CMK 1.67, final inspection CPK 1.33. After a lot of processing validation, the whole line performs stable and liable.
CASE 2

Automatic processing line of half axle gear

Workpiece: Half axle gear
Material: 20CrMnTiH

This project is consisted of 5 lines, every line is consisted of 1 HUB20 robot and 2 NL201HA CNC lathe, made 5 different products, due to the similarity of the 5 lines, now instruct operation condition of 1 of them – line of half axle gear.

Process introduction:

**OP10:**
Processing of workpiece back cone, outer circle and end face. Fixture positioned the workpiece by spindle nose and gear cage, servo tailstock move to set tight the end face of workpiece. Tools consist of roughing and finishing turning tool.

**OP20:**
Processing the other face of workpiece, processing inner holes, chamfers and back stop hole. Fixture is special chuck, position the workpiece in the center by gear cage, back pull jaw clamp the workpiece. Tools consist of external turning tool, roughing inner hole tool, step hole tools and finishing inner hole tool.

The customer is the production of automobile gearbox, automobile differential gear professional manufacturers, the gear of company applied to the major car brands.
Automatic processing line of claw pole
Workpiece: claw pole
Material: 40CrMo

Process instruction:

OP10:
Use NL201HC horizontal CNC lathe, clamp inner boss, drill, turning outer round and big end face.

OP20:
Use NL201HC horizontal CNC lathe, clamp outer cylinder, turning little end face, boring inner hole.

Automatic processing line of claw pole is consisted of 2 NL201HC horizontal CNC lathe, truss manipulator, rotary silo, turnover station, manual inspection station, etc, achieve automatic load and unload material. Cycle time 46s/pc, annual output 470 thousand pieces.

The machine fixture uses back pull chuck, soft jaw for self-turning, can stably clamp inner boss with draft angle, outer round, to keep processing size stable.

Manipulator claw is turnover 2-station claw, achieve load and unload of workpiece and carriage of workpiece.

Rotary silo can save 60 pieces 1 time, can let the machine work for 46 minutes.

Turnover station use to turn over the workpiece by 180 degrees between two procedures.

Automatic processing line is equipped with manual inspection station, can set frequency of inspection, manipulator will take finished parts into inspection station.
CASE 4

Automatic processing line of forged steel valve
Workpiece: Forged steel valve
Material: A105

Processing instruction:

OP10:
Use VM903H vertical machining center, with CNC-250 rotary table and strong tailstock, special fixture, clamp 3 faces in 1 time.

OP20:
Use NL502SA horizontal CNC lathe, equipped with rotary chuck special fixture, finish processing 3 faces in 1 time.

Automatic processing line is consisted of 1 VM903H vertical machining center, 1 NL502SA horizontal CNC lathe, joint robot, silo, manual inspection station, etc. Achieve automatic load and unload of automatic line. The whole line cycle time 297s/pc, annual output 760 thousand pieces.

Automatic line uses special silo, workpiece install in the silo by special way, prevent operation person install blank wrongly and make the machine crush.

End product
CASE 5

Automatic processing line of shutoff valve
Workpiece: Shutoff valve
Material: 316 stainless steel

Processing introduction:

OP10:
Use NL251H horizontal CNC lathe automatic index chuck with 1 time clamp, process end face, inner hole, outer round, thread of 3 ends of valve body. Automatic processing line is consisted of 3 NL251H horizontal CNC lathes, FANUC joint robot, silo, etc. Achieve automatic load and unload of valve body processing, the whole line cycle time 90s/pc, annual output 245 thousand pieces. Pallet silo saves 110 pieces in 1 time, can make automatic line 165 minutes processing.

CASE 6

Automatic processing line of automobile wheel hub
Workpiece: Wheel hub
Material: QT450–10

Processing introduction:

OP10:
Use NL322H horizontal CNC lathe, clamp one side, process the other side.

OP20:
Use NL322H horizontal CNC lathe, internal support inner hole which OP10 processed, process the other side.

OP30:
Use VM903H vertical machining center, position by the inner hole which OP10 processed, add the other holes.
**CASE 7**

Automatic processing line of heat exchanger

*Workpiece:* heat exchanger  
*Material:* ZL104

Automatic processing line of heat exchanger is consisted of 4 processing equipment and 1 set double truss manipulator, achieve process control between blank to end product, processing time 12min/pc, achieve annual output 120 thousand sets. In the process preparation and collection of workpieces use automatic saving system of material, multiple devices simultaneously complete processing the same procedure, manipulator according to the order of the signal of equipment and grip the workpiece, reduce waiting time of processing, achieve maximum intelligence production.

**Processing Introduction:**

- **OP10:**  
  Use VM1103H vertical machining center, positioning by form of workpiece, use 4 axis rotation, processing all the procedure of workpiece.

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**CASE 8**

Automatic processing line of elevator shaft

*Workpiece:* Shaft  
*Material:* 45# steel

**Processing instruction:**

- **OP10:**  
  Use NL504SA horizontal CNC lathe, clamp one side of shaft blank, turning and face, outer round of the other side;  
- **OP20:**  
  Use NL504SA horizontal CNC lathe, clamp outer round which OP10 processed, turning end face, outer round of the other side;  
- **OP30:**  
  Use VM903H vertical machining center, clamp outer round, milling the face of two side.

Automatic processing line of elevator shaft is consisted of 3 NL504SA horizontal CNC lathes, 1 VM903H vertical machining center, truss manipulator, gravity feeding track, turnover station, equal pitch unload track, achieve automatic load and unload of processing. Whole line cycle time 418.8s/pc, annual output 520 thousand pieces.
CASE 9

Automatic processing line of piston
Workpiece: Caliper piston
Material: 10#

Processing instruction:
OP10:
Use NL161HC horizontal CNC lathe, clamp one side of workpiece, process the other side.
OP20:
Use NL161HC horizontal CNC lathe, clamp outer round which is processed is OP10, process the other side.
OP30:
Use NL161HC horizontal CNC lathe, clamp outer round of workpiece, process the other side.

Automatic processing line is consisted of 1 manipulator and 2 machines, achieve process control between blank to end product. Processing time 46s/piece, annual output 470 thousand sets. In the process preparation and collection of workpieces use automatic saving system of material, between procedure use automatic logistic system, reduce human intervention, Maximize the intelligent production.

CASE 10

Automatic processing line of steering shaft
Workpiece: Upper part of steering shaft
Material: Steel tube 45#

Processing introduction

OP10:
Use NL201HG horizontal CNC lathe, 3-jaw chuck clamps outer round in the middle of workpiece, position the end face, turning on the end face of small side, drilling the center hole;
Processing time: 27s
OP20:
Use NL201HG horizontal CNC lathe, 3-jaw chuck clamps outer round in the middle of the workpiece, position the end face, turning on the end face of big side, spline inner hole and orifice chamfer.
Processing time: 27s
OP30:
Use NL201HG horizontal CNC lathe, inner hole expanding sleeve expands inner hole, hydraulic tailstock top tight workpiece. Finish turning outer round.
Processing time: 54s
OP40:
Use VM903SL vertical machining center, 4 axis clamp, expanding sleeve expands inner hole, hydraulic tailstock top tight workpiece, milling groove and drilling holes with 4 axis.
Processing time: 81s

Automatic processing line is consisted of 2 NL210HG CNC lathe, 3 VM903SL vertical machining center with 5 truss manipulator and 6 temporary storage track, the length of truss is 36.5m. The whole line cycle time 27s, annual output 800 thousand pieces.
Use manipulator to exchange material, reduce staffing and labor intensity, improve processing stability, increase production, reduce costs.
**CASE 11**

Automatic processing line of Retarder stator  
Workpiece: Retarder stator  
Material: QT450  

**Processing Instruction:**  

- **OP10:**  
  Use NL322H horizontal CNC lathe, clamp outer round of workpiece, turning end face, outer round, groove and inner holes.

- **OP20:**  
  Use NL322H horizontal CNC lathe, clamp outer round of workpiece, turning and face, outer round, groove and inner holes.

- **OP30:**  
  Use VM1103S vertical machining center, equipped with special fixture, processing end face hole, groove, etc.

- **OP40:**  
  Use VM1103H vertical machining center, equipped with CNC-320 5-axis rotary table, 5 axis process inclined hole on the back of blade.

Automatic line is consisted of 2 NL322H horizontal CNC lathe, 1 VM1103S vertical machining center, 2 VM1103H vertical machining center, truss manipulator, rotary silo, turnover station, manual inspection station, etc. Achieve automatic load and unload material of automatic processing. Whole line cycle time 720s/pc, annual output 32.4 thousand pieces.  

OP20, OP30, OP40 uses special fixture with airtightness detecting on end face, prevent to begin processing when clamp workpiece not in place, make the parallel out of limit.

Automatic line uses special silo, workpiece install in the silo by special way, prevent operation person install blank wrongly and make the machine crush.

**CASE 12**

Automatic processing line of bearing inner race  
Workpiece: inner race  
Material: 16MnCr5  

**Processing Instruction:**  

- **OP10:**  
  Use T-6 horizontal CNC lathe, clamp outer round of workpiece, turning end face, outer round, groove and inner holes.

- **OP20:**  
  Use T-6 horizontal CNC lathe, support inner hole, turning end face, outer round, raceway, groove.

Automatic processing line consisted of 2 T-6 horizontal CNC lathe, truss manipulator, rotary silo, turnover station, manual inspection station, etc. Achieve automatic load and unload of processing. Whole line cycle time 615s/pc, annual output 360 thousand pieces.  

OP20 machine uses elastic expansion sleeve with airtightness detecting on end face, prevent to begin processing when clamp workpiece not in place, make the parallel out of limit.  

Automatic line add inspection of workpiece face, prevent operation person load blank opposite make machine crush.